12-1-2020

Swine Disease Reporting System Report #34

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Swine Disease Reporting System
Report # 34 (December 1, 2020)

What is the Swine Disease Reporting System (SDRS)? SDRS includes multiple projects that aggregate data from participating veterinary diagnostic laboratories (VDLs) in the United States of America (USA), and reports the major findings to the swine industry. Our goal is to share information on endemic and emerging diseases affecting the swine population in the USA, assisting veterinarians and producers in making informed decisions on disease prevention, detection, and management.

After aggregating information from participating VDLs and summarizing the data, we ask the input of our advisory group, which consists of veterinarians and producers across the USA swine industry. The intent is to provide an interpretation of the observed data, and summarize the implications to the industry. Major findings are also discussed in monthly podcasts. All SDRS reports and podcasts are available at www.fieldepi.org/SDRS. The SDRS projects are:

Swine Health Information Center (SHIC)-funded Domestic Swine Disease Surveillance Program: collaborative project among multiple VDLs, with the goal to aggregate swine diagnostic data and report in an intuitive format (web dashboards and monthly PDF report), describing dynamics of pathogen detection by PCR-based assays over time, specimen, age group, and geographical area. Data is from the Iowa State University VDL, South Dakota State University ADRDL, University of Minnesota VDL, and Kansas State University VDL.

Collaborators:

Iowa State University: Giovani Trevisan, Edison Magalhães, Leticia Linhares, Bret Crim, Poonam Dubey, Kent Schwartz, Eric Burrough, Phillip Gauger, Pablo Pineyro, Christopher Siepker; Rodger Main, Daniel Linhares.

Project coordinator Giovani Trevisan. Principal investigator Daniel Linhares.

University of Minnesota: Mary Thurn, Paulo Lages, Cesar Corzo, Jerry Torrison.

Kansas State University: Rob McGaughey, Eric Herrman, Roman Pogranichniy, Rachel Palinski, Jamie Henningson.

South Dakota State University: Jon Greseth, Darren Kersey, Travis Clement, Jane Christopher-Hennings.

Disease Diagnosis System: A pilot program with the ISU-VDL consisting of reporting disease detection (not just pathogen detection by PCR), based on diagnostic codes assigned by veterinary diagnosticians.

FLUture: Aggregates influenza A virus (IAV) diagnostic data from the ISU-VDL and reports results, metadata, and sequences.

PRRS virus RFLP report: Benchmarks patterns of PRRSV RFLP pattern detected at the ISU-VDL over time, USA state, specimen, and age group.

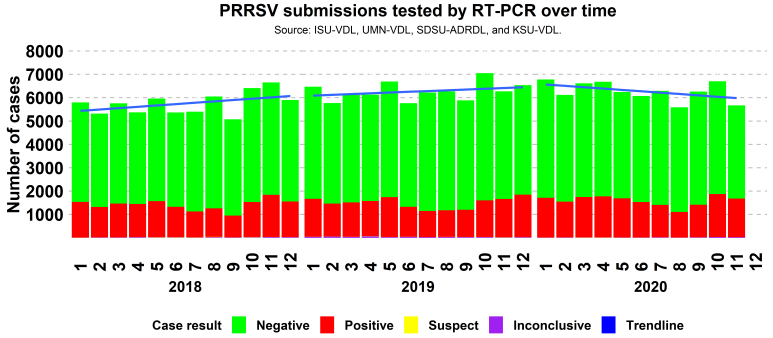
Audio and video reports: Key findings from SDRS projects are summarized monthly in a conversation between investigators, and available in the form of an 'audio report', and "video report" through SwineCast, YouTube, LinkedIn, and the SDRS webpage.

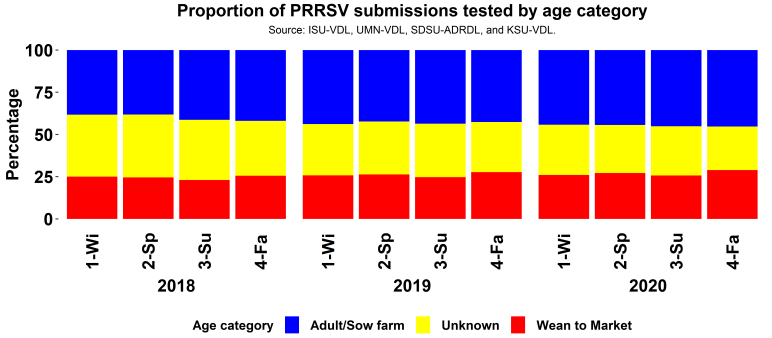
Advisory Group: Reviews and discusses the data, providing their comments and perspectives on a monthly: Clayton Johnson, Mark Schwartz, Paul Sundberg, Paul Yeske, Rebecca Robbins, Tara Donovan, Deborah Murray, Scott Dee, Melissa Hensch, Scanlon Daniels, Brigitte Mason, Randy Jones.

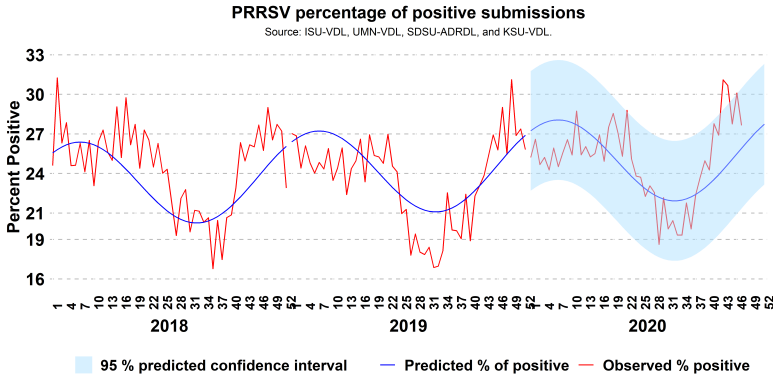
In addition to this report, interactive dashboards with aggregated test results are available at www.fieldepi.org/SDRS.

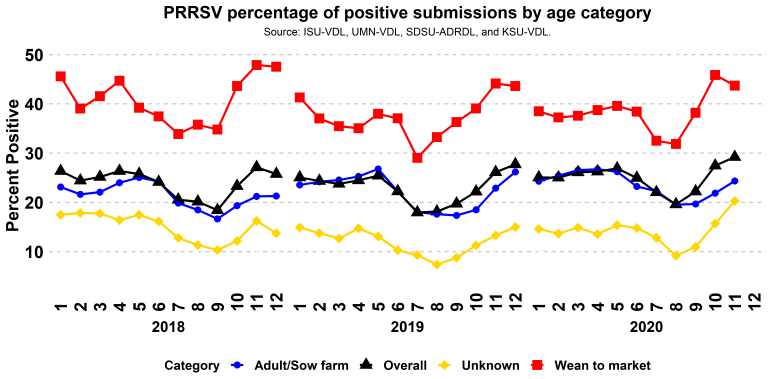
Note: This report contains data up to November 29, 2020.

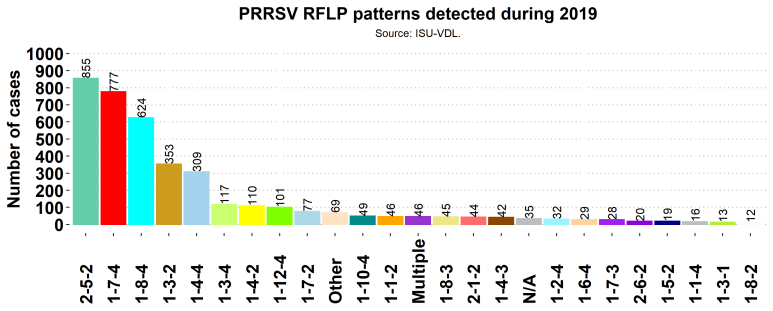
Topic 1 – Detection of PRRSV RNA over time by RT-qPCR.











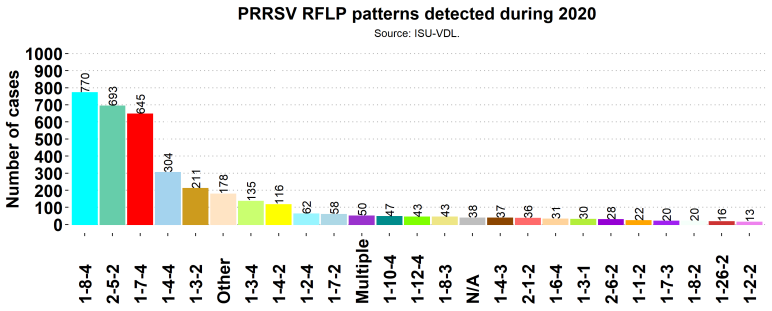


Figure 1. Top: *left*: Results of PRRSV RT-PCR cases over time. *Right*: expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results based on weekly data observed in the previous 3 years. **Middle**: *Left* Proportion of accession ID cases tested for PRRSV by age group per year and season. *Right*: percentage of PRRSV PCR-positive results, by age category over time. Wean to market corresponds to nursery and grow-finish. Adult/Sow correspond to Adult, boar stud, breeding herd, replacement, and suckling piglets. Unknown corresponds to not informed site type or farm category. **Bottom** The 25 most frequently detected RFLP patterns *left* year of 2019; *right* year of 2020. RFLPs indicated as N/A represents not detected, or European PRRSV.

SDRS Advisory Group highlights:

- Overall, 29.21% of 5,673 cases tested PRRSV-positive in November, similar to 27.46% of 6,701 in October;
- The overall PRRSV detection was outside of the upper boundaries of the forecasted levels between October 26 to November 7;
- Positivity in adult/sow category in November was 24.35% (631 of 2,591), a moderate increase from 21.87% (653 of 2,986) in October;
- Positivity in wean-to-market category in November was 43.72% (748 of 1,711), a moderate decrease from 45.88% (918 of 2,001) in October;
- Overall PRRSV-percentage of positive cases was above 3 standard deviations from state-specific baselines in MN, SD, IA, NE, MO, and IN;
- The advisory group pointed out that the increase in PRRSV detection in the wean-to-market age category has put pressure on sow farms, leading to lateral breaks in sow farms and finishing sites. Associated factors include colder weather favoring area spread of the virus, by vaccination and load our crews, transport, and other indirect routes.

Topic 2 – Detection of RNA of enteric coronavirus by RT-qPCR

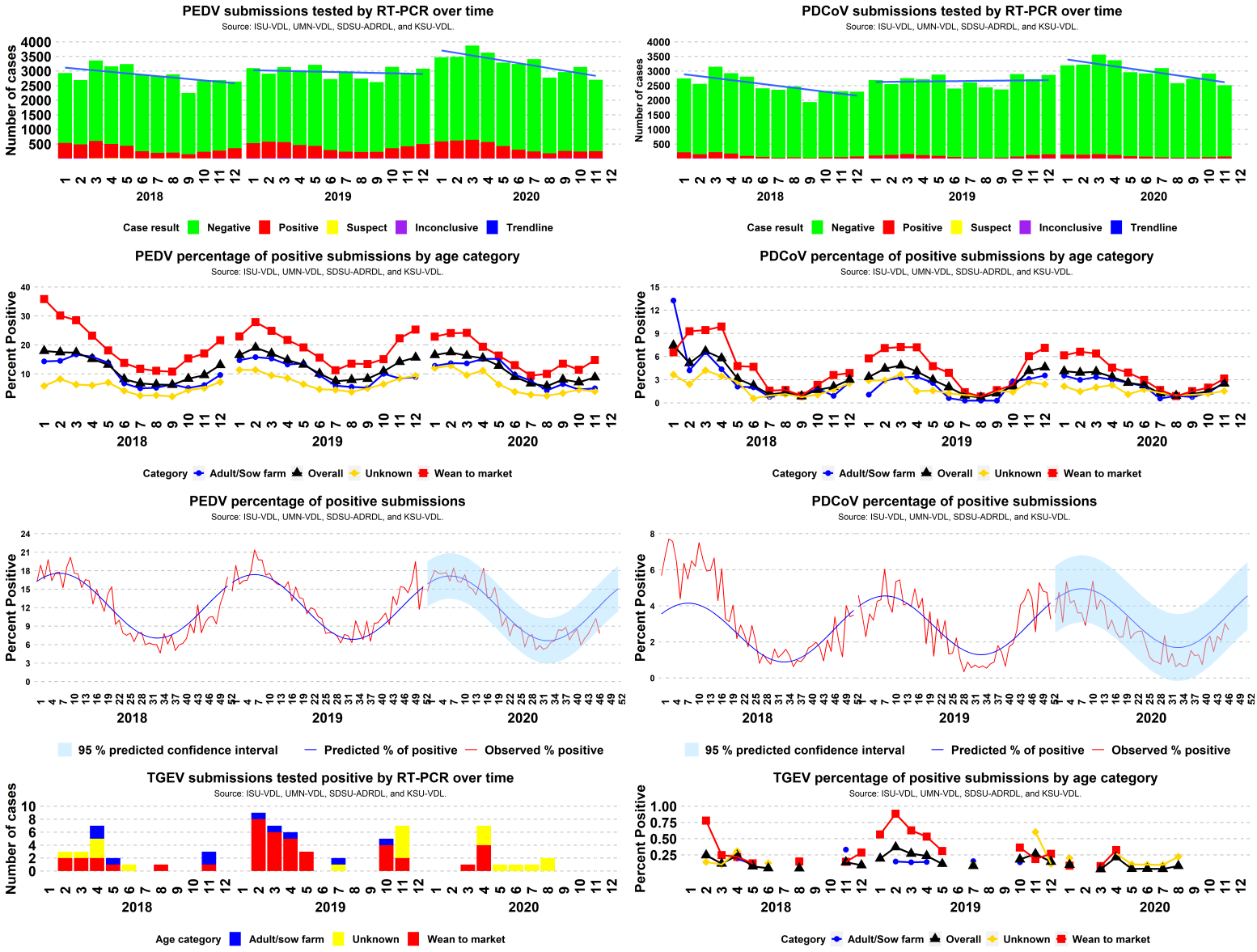


Figure 2. Top: *left* PEDV *right* PDCoV cases tested by RT-PCR over time. **Second from top**: B:*left* PEDV *right* PDCoV percentage of PCR-positive results, by age category over time. **Second from bottom**: *left* PEDV *right* PDCoV expected percentage of positive results for cases tested by RT-qPCR and 95% confidence interval for 2020 predicted value. **Bottom**: *left* number of TGEV positive cases by age category *right* percentage of TGEV PCR-positive cases by age category. Each color represents one distinct age category.

SDRS Advisory Group highlights:

- Overall, 8.81% of 2,703 cases tested PEDV-positive in November, similar to 7.13% of 3,140 in October;
  - Positivity in adult/sow category in November was 5.03% (39 of 775), similar to 4.62% (43 of 931) in October;
  - Positivity in wean-to-market category in November was 14.82% (167 of 1,127), a moderate increase from 11.43% (133 of 1,164) in October;
  - Overall PEDV-percentage of positive cases was within or below baseline level for all 11 monitored states;
- Overall, 2.5% of 2,516 cases tested PDCoV-positive in November, similar to 1.51% of 2,917 in October;
  - Positivity in adult/sow category in November was 2.65% (19 of 716), similar to 1.29% (11 of 851) in October;
  - Positivity in wean-to-market category in November was 3.15% (32 of 1,017), similar to 1.97% (21 of 1,064) in October;
  - Overall PDCoV-percentage of positive cases was within or below baseline level for all 10 monitored states;
- The overall PEDV and PDCoV-detection was within the expected boundaries of the forecasted levels for this time of the year;
- There was 0 positive case for TGEV RNA in November 2020 over a total of 2,456 cases tested;
- The advisory group pointed out that despite a lower detection of enteric coronavirus in October-November, the swine industry should keep vigilant on these agents. Compliance with cleaning and disinfection procedures at a farm and transportation level, routes of transport, people and animal movements, feed supply chain security, closely monitoring finishing sites, and having a contingency plan to avoid additional farm contamination can contain further spread of these agents. One system in the Midwest reported some increase in PEDV outbreaks in grow-finish.

Topic 3 – Detection of *Mycoplasma hyopneumoniae* (MHP) DNA by PCR.

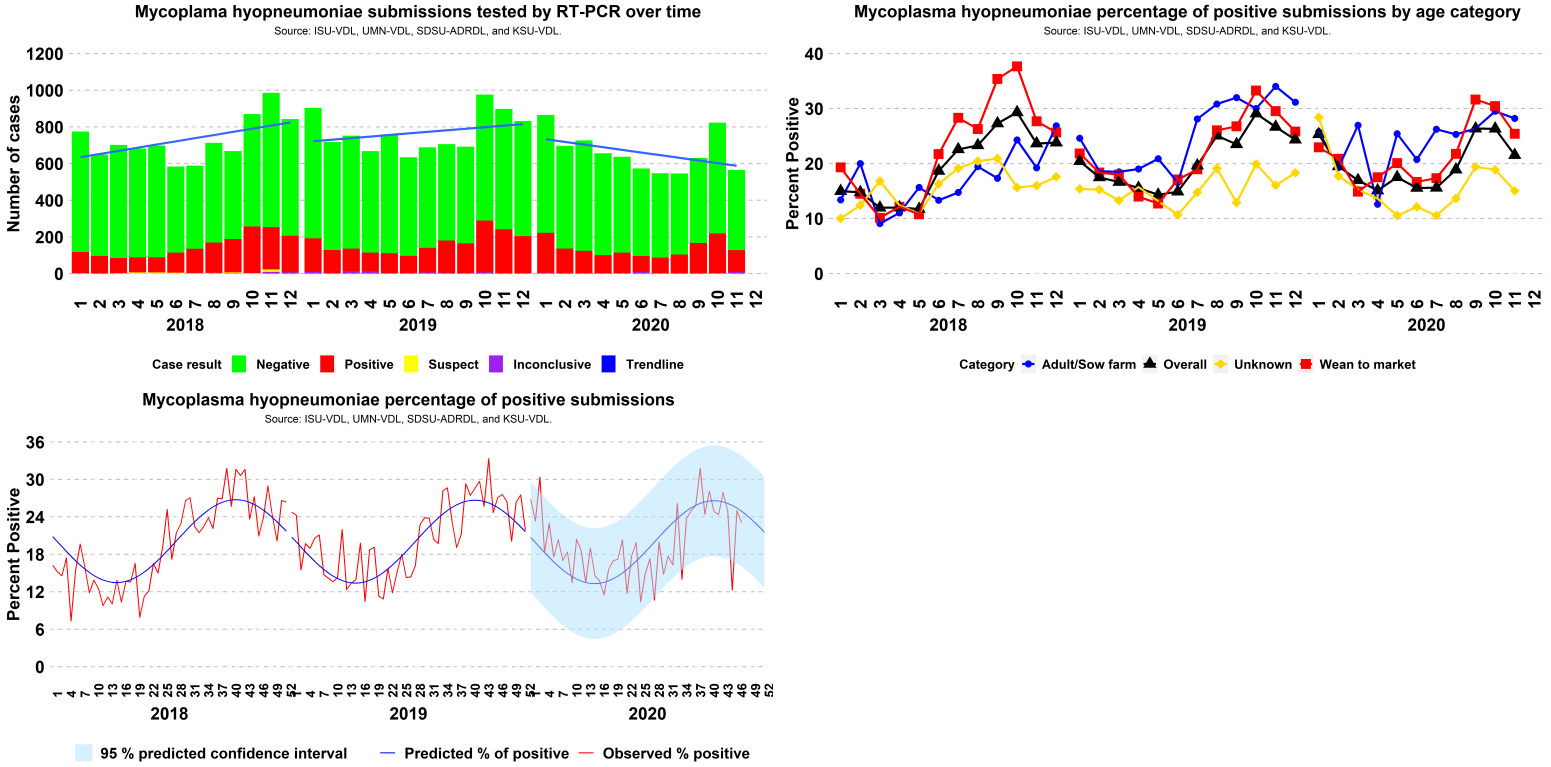


Figure 3. *Left top*: results of MHP PCR cases over time. *Right top*: expected percentage of positive results for MHP by PCR and 95% confidence interval for 2020 predicted value, based on weekly data observed in the previous 3 years. *Bottom*: percentage of MHP PCR-positive results, by category over time.

SDRS Advisory Group highlights:

- Overall, 21.54% of 557 cases tested *M. hyopneumoniae*-positive cases in November, a moderate decrease from 26.34% of 820 in October;
- As expected, the observed overall detection of *M. hyopneumoniae*-positive cases is decreasing following the forecasted levels of detection for this time of the year;

Topic 4 – Disease diagnosis at the ISU-VDL.

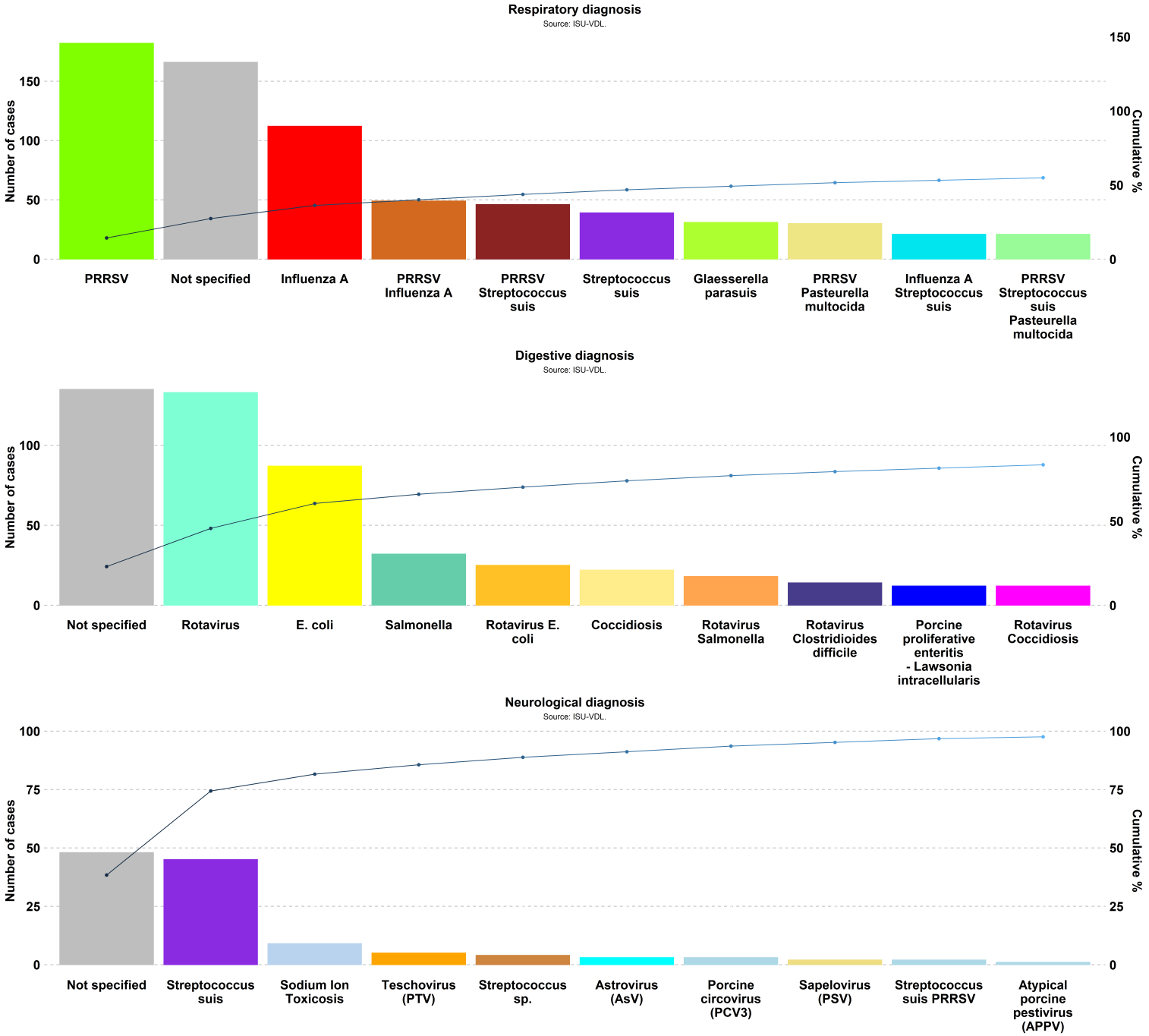


Figure 4. Most frequent disease diagnosis by physiologic system at ISU-VDL . Presented system is described in the title of the chart. Colors represent one agent and/or the combination of 2 or more agents. Only the physiologic systems with historic number of cases per season above 100 are presented in the report.

Note: Disease diagnosis takes one to two weeks to be performed. The graphs and analysis contain data from October 1 to November 14.

SDRS Advisory Group highlights:

- PRRSV (182 of 1270) continues to lead the number of respiratory diagnoses. After Not specified (135 of 587), Rotavirus (134 of 587) leads the digestive diagnoses. After Not specified (48 of 125), *S. suis* (46 of 125) leads the the neurological diagnosis;
- From October 5 to November 7, there was a significant increase (signal) in the number of disease diagnosis at ISU-VDL, mostly contributed by increased diagnosis for agents classified as respiratory, systemic, digestive and urogenital diagnosis;
- As expected for this time of the year, there was a significant increase (signal) in diagnosis of from October 5 to November 7 for PRRSV and from October 12 to November 7 for influenza A, *S.suis*, *G.parasuis*, PCV2, *B. bronchiseptica*, and *P. multocida*;
- The advisory group pointed out that efforts towards a better diagnosis for updates on autogenous vaccine and time of the year favoring these agents' incidence contributes to a higher number of cases with disease diagnosis.